and diagnostic research.
In this work a simple procedure was developed to prepare a carbon-ceramic electrode (CCE) modified with multi wall carbon nanotubes (MWCNTs) and IL ($EMIBF_4$) nanocomposite. The electrochemical behavior of DA was investigated on the obtained electrodes. During the oxidation of DA on the IL/MWCNT/CCE; one reversible oxidation peak is observed. It was found that a maximum current response can be obtained at pH 0.4 in phosphate buffer solution. The oxidation peak current was found to be linearly related to DA concentration in the range of 0.4-50 μM with a detection limit of 0.24 μM. Also, the modified electrode shows an excellent analytical performance for for the simultaneous determination of DA, AC and AA. The IL/MWCNT/CCE in the DPV technique DA, AC and AA gave sensitive oxidation peaks at -50, 119 and 339 mV versus saturated calomel electrode, respectively. This passer-by, a sensitive DPV procedure was developed for the simultaneous analysis of DA, AC and AA.

References
[1] A. Merkoçi, Microchim Acta 152 (2006) 157-174.
[2] O. Lev, Z. Wu, S. Bharathi, V. Glezer, A. Modestov, J. Gun, L. Rabinovich, S. Sampath, Chem. Mater. 9 (1997) 2354-2375.

Determination of azide ion in water samples using magnetic carbon nanotubes assisted solid liquid extraction with experimental design for optimization of the procedure

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Sodium azide has been widely used as a major component in many different industries such as production of pesticides, anti-hypertensives, anti-HIV drugs and explosives as well as preservatives[1-4].furthermore, azide salts are very toxic compound implicated in many poisoning cases [5]. Recently, a new kind of carbon based nano-materials, multi-walled carbon nanotubes (MWNTs), have been used in many analytical fields. The potential of MWNTs as a solid phase extraction (SPE) adsorbents for the pre-concentration of environmental pollutants has been investigated in the recent years [6].
We have reported a simple, sensitive and inexpensive kinetic spectrophotometric method for determination of azide ion after separation using magnetic nanocomposites that have been modified by surfactant as a sorbent. The preparation of magnetic nanocomposites was carried out in two different ways. In the first one, the raw carbon nanotubes were functionalized (Carboxylated) and iron oxide particles were placed on their surfaces. In the second process, iron oxide particles were placed on the carbon nanotubes directly. Efficiency of these two methods were examined. Taguchi method was applied as an experimental design to determine optimum conditions. Under optimal conditions, the linear range of azide ion 0.05-1.0 ($\mu g.mL^{-1}$), detection limit of 0.015 ($\mu g.mL^{-1}$) with reproducibility of 2.15% were obtained. This technique was successfully used for determination of azide ion in well, tap and mineral waters.

References
[1] P. Marquet , S. Clement, Anal. Toxicol.20 (1996) 134.
[2] K. Tsuge, M. Kataoka , Y. Seto, J. Anal. Toxicol.25 (2001) 228.
[3] MasatakaOhashi, Yoshimi Kitada, Shunsuke Imai, J. Chromatogr. A 1045 (2004) 247–252
[4] Roger T. Echols, Ryan R. James, Joseph H. Aldstadt, Analyst. 122(1997) 315-319.
[5] K. Vinkovic , V. Drevenkar , J. Chromatogr. B 864 (2008) 102–108.
[6] Qingxiang Zhou,Junping Xiao, Weidong Wang, J. Chromatogr. A 1125 (2006) 152–158

Adsorption of toxic inorganic compounds from water with surface-modified silica aerogel

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Recently, the pollution of water resources with heavy metals has been causing worldwide concern in the last few decades. Namely, some metals can have toxic or harmful effects on many forms of life. Wastewater from many industries contains one or more toxic heavy metals [1, 2]. Metals that are significantly toxic to human beings and ecological environments are cupper (Cu), mercury (Hg), chromium (Cr), lead (Pb), manganese (Mn), cadmium (Cd), etc.
In adsorption processes, adsorbents with high specific surface areas are needed. Small pores, such as micropores and mesopores, result in large specific surface area responsible for adsorption. Pore size, pore distribution and surface area, as well as pore surface chemistry, are the major factors in the adsorption process [3,4].Furthermore, one of the most important properties of silica aerogels is also the possibility to modify their surface chemical nature with the incorporation of organic functional groups [5].
Industrial-grade waterglass (sodium silicate solution) was used as a source of the cost-effective silica sols. Aqueous colloidal silica hydrosol obtained from the ion-exchange of an industrial waterglass that was used as an inexpensive starting material. After gelation and aging, the poreswater of silica hydrogel was sequentially exchanged with n-Hexane by multiple solvent exchanges using acetone as an intermediate exchanging solvent. Surface modification of gel surface was controlled using organosilane. Surface-modified gel was carefully dried at atmospheric pressure. The ability of modified silica aerogel with organosilane to remove Pb(II) from aqueous solutions was assessed using batch adsorption technique under equilibrium conditions. Adsorbent exhibits very high adsorption potential for heavy metal ion and the removal of more than 85%was achievedat optimized conditions.

References
[1] L.Hartiger,Handbuch der Abwasser – und Recycling technics Munchen, Carl HanserVerlag, Wien, 1991.
[2] R.T. Yang, Adsorbents: fundamentals and Application, WileyInterscience, 2003.
[3] S.W. Hwang, H.H. Jung, S.H. Hyun, Y.S. Ahn, J. Sol-Gel Sci. Technol. 41 (2007) 139.
[4] A.P. Rao, A.V.Rao, G.M. Pajonk, Appl. Surf. Sci. 253 (2007)6032.
[5] T. Chaisuwan, T. Komalwanich, S. Luangsukrerk, S. Wongkasemjit, Removal of heavy metals from model wastewater by using polybenzoxazine aerogel, Desalination 256 (2010) 108-114.

Removal of alizarin red and alizarin yellow from aqueous solution by nano Alumina: application of Taguchi method and principle component analysis to the Multi-response optimization

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This study revealed that nano structure γ-alumina was an effective adsorbent for removal of alizarin red and alizarin yellow from aqueous solutions. The main objective of this study was using the Taguchi design approach and principal component analysis (PCA) to find effective parameters for achieving high